WM-AF64/BF64

SERVICE MANUAL

US Model
Canadian Model
WM-AF64

AEP Model
UK Model
E Model
WM-BF64

Photo : WM-AF64
Gray Type

SPECIFICATIONS

Radio section

Frequency range
FM: 87.6—108MHz (EXCEPT FOR WG model)
87.6—107MHz (WG model)
AM: 530—1,605kHz (EXCEPT FOR WG model)
531—1,602 (WG model)

Antenna
FM: Headphone cord antenna
AM: Built-in ferrite bar antenna

Tape player section

Frequency response (Dolby NR off)
30—15,000 Hz

Power output
20 mW + 20 mW load impedance 18 ohms at DC operation

Power requirements
3 V DC
Two size AA (R6) batteries
DC IN 3V jack accepts:
- Optional Sony EBP-500B battery case for use with two size D (R20) batteries
- Optional Sony AC-D2L AC power adaptor for use on 120V AC, 60Hz (US, Canadian model)
for use on 120V AC, 60Hz or 220V AC, 50Hz (E model)
for use on 220V AC, 50Hz (AEP, WG model)
for use on 240V AC, 50Hz (UK model)
- Optional Sony DCC-70 car battery cord for use with 12V car battery

Battery life
Approx. 8 hours on tape playback and approx. 20 hours on FM reception, using Sony alkaline batteries AM3 (N)

Dimensions
Approx. 116.1×93.1×37.4 mm (w/h/d)
(4⅝×3½×1½ inches)
incl. projecting parts and controls

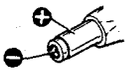
Weight
Approx. 245 g (8.7 oz)
incl batteries

Accessory supplied
Belt clip (1)
US, Canadian, AEP, UK, WG model):
Stereo headphones (open-air type, 1)
E model:
Stereo earphones (open-air type, 1)

● WG model: West Germany model

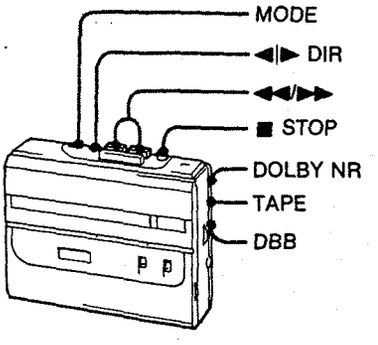
Model Name Using Similar Mechanism	WM-F59/F69
Tape Transport Mechanism Type	MF-WM69-80

Note: Use only the recommended AC power adaptor or car battery cord manufactured by Sony. Polarity of the plugs of other manufacturers may be different.



Polarity of the Sony plug

PARTS IDENTIFICATION



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RADIO CASSETTE PLAYER

SONY®

MICROFILM

TABLE OF CONTENTS

Section	Title	Page
SECTION 1	**DISASSEMBLY**	
1-1.	Cassette Holder	2
1-2.	Rear Cabinet	2
1-3.	Mechanism Deck	2
1-4.	Tuner Unit	3
1-5.	Pointer Rack Setting	3
SECTION 2	**MECHANICAL MEASUREMENTS**	3
SECTION 3	**ELECTRICAL ADJUSTMENTS**	
3-1.	Cassette Section	4
3-2.	Radio Section	5
SECTION 4	**DIAGRAMS**	
4-1.	Printed Wiring Board	7
4-2.	Schematic Diagrams —Tape Recorder Section—	11
4-3.	Schematic Diagrams —Tuner Unit—	13
SECTION 5	**EXPLODED VIEWS**	
5-1.	Cabinet, Cassette Holder Section	15
5-2.	Mechanism (1)	16
5-3.	Mechanism (2)	17
SECTION 6	**ELECTRICAL PARTS LIST**	18

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270℃ during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

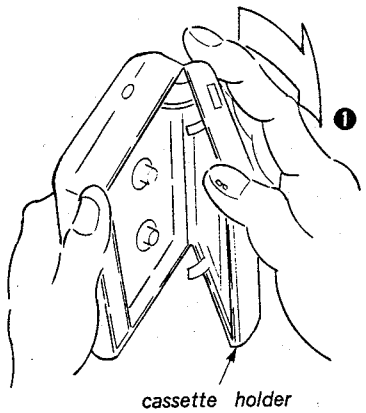
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

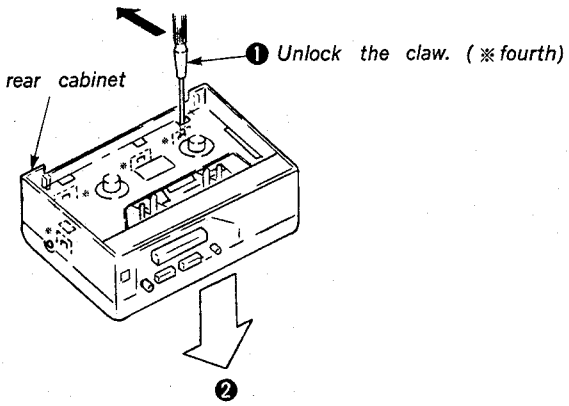
SECTION 1
DISASSEMBLY

Note: Follow the disassembly procedure the numerical order given.

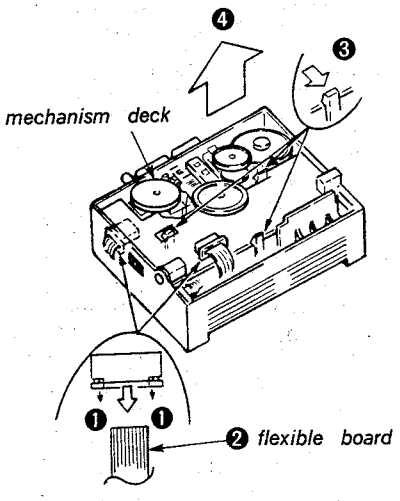
1-1. CASSETTE HOLDER



1-2. REAR CABINET

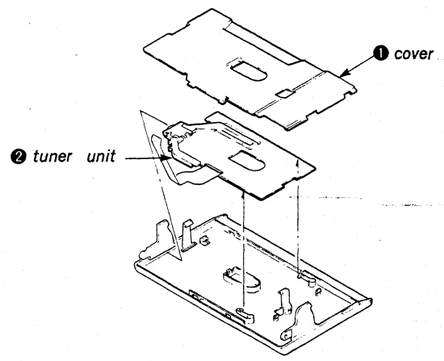


1-3. MECHANISM DECK

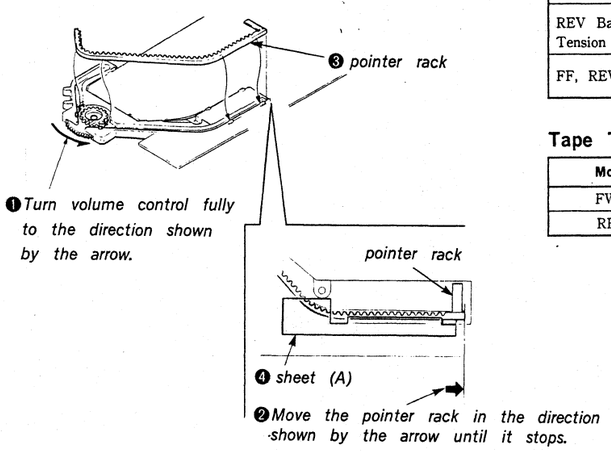


SECTION 2
MECHANICAL MEASUREMENTS

1-4. TUNER UNIT



1-5. POINTER RACK SETTING


❸ pointer rack
❶Turn volume control fully to the direction shown by the arrow.
pointer rack
❹ sheet (A)
❷Move the pointer rack in the direction shown by the arrow until it stops.

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab:
   playback head — pinch roller
   capstan — rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	25—55g•cm (0.30—0.76oz•inch)
FWD Back Tension		less than 3 g•cm (less than 0.04oz•inch)
REV	CQ-102RB	22—55 g•cm (0.30—0.76oz•inch)
REV Back Tension		less than 3 g•cm (less than 0.04oz•inch)
FF, REW	CQ-201B	more than 60g • cm (more than 0.83oz•inch)

Tape Tension Measurement

Mode	Torque meter	Meter reading
FWD	CQ-403A	more than 55 g•cm (more than 0.76oz•inch)
REV	CQ-403R	

SECTION 3
ELECTRICAL ADJUSTMENTS

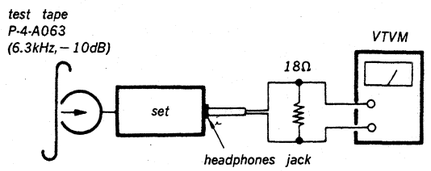
3-1. CASSETTE SECTION

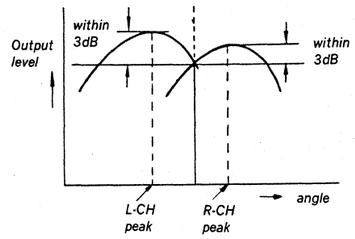
Playback Head Azimuth Check
• perform this check both in FWD and REV mode.

Note: This set is not featured the head azimuth adjustment. When repacing the head, check the both L-ch and R-ch output levels and also those phases.

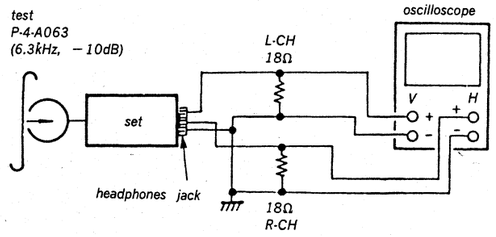
Procedure:

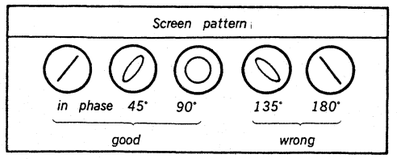
1. Level Check
   Mode : playback





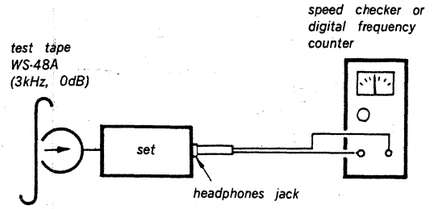
2. Phase Check
   Mode : playback





Tape Speed Adjustment

Procedure:
Mode: playback

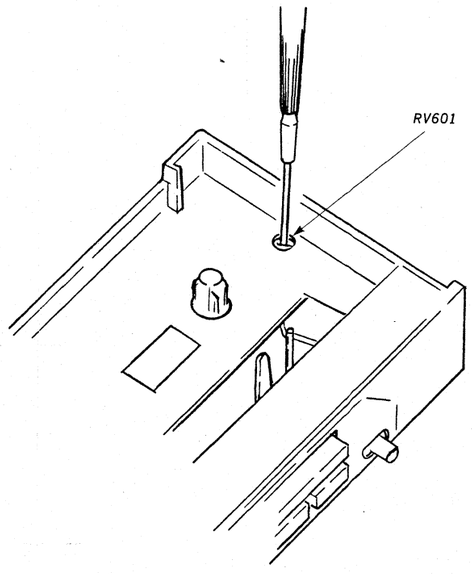


Specification:

Speed checker	Digital frequency counter
±1%	2,970—3,030Hz

Frequency difference between the beginning and the end of the tape should be within±2.5% (±75%Hz).

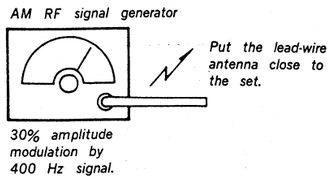
Adjustment Location: RV601

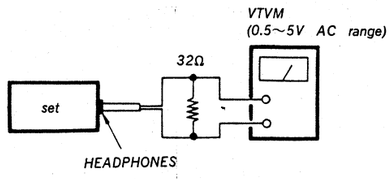


3-2. RADIO SECTION

AM

Setting
Function: RADIO
BAND: AM





AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
T6	620kHz
CT2	1,400kHz

( ): West Germany model

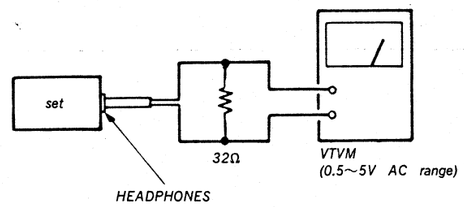
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
T3	525kHz (531kHz)
CT3	1,650kHz (1,602kHz)

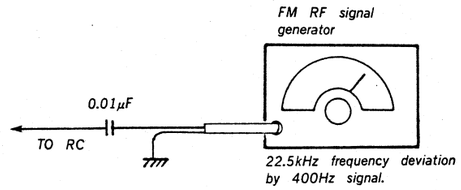
AM IF ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
T4	455kHz

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capactiors.

FM

Setting:
FUNCTION : RADIO
BAND FM (DX): WM-AF64
FM (ST): WM-BF64





- Repeat the procedures in each adjustment several times, and the adjustments should be finally done by the trimmer capactiors.

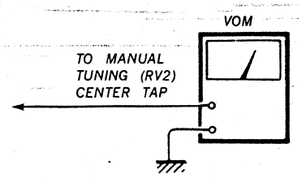
* FM frequency coverage adjustment should be done after frequency control voltage adjustment.

( ): West Germany model

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
87.0MHz (87.6MHz)	108.5MHz (107MHz)
T2	CT1

FREQUENCY CONTROL VOLTAGE ADJUSTMENT

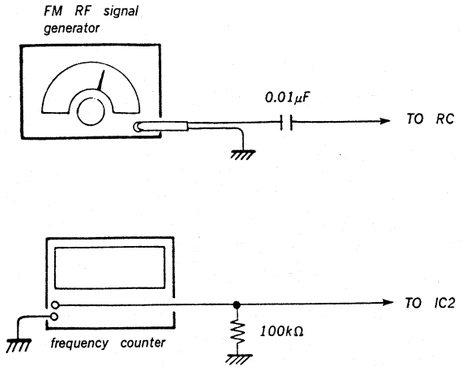
* This adjustment should be done before FM frequeency coverage adjustment.



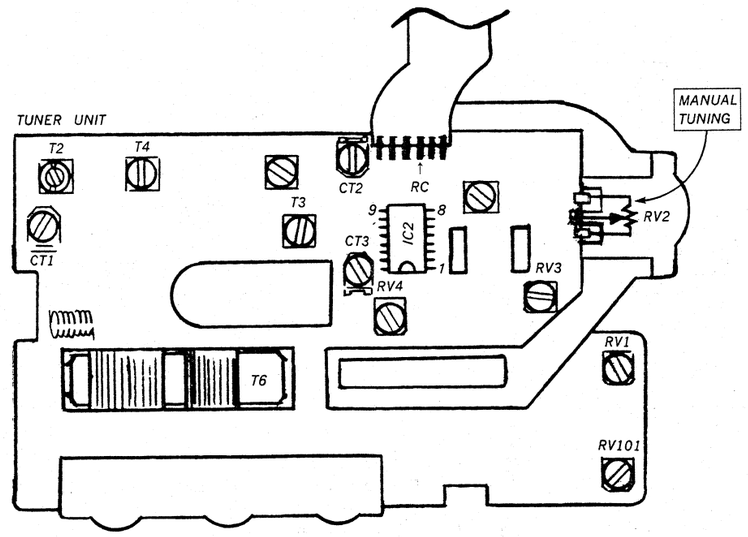
to be adjusted	RV3(PRESET / RV101)	RV1
readings	1V±0.1V	9V±0.1V
tuning dial	f min	f max

VCO Adjustment

procedure: Carrier frequency: 98MHz
Modulation: 1kHz deviation (30%)



1. Tune the set to 98MHz.
2. Adjust RV4 for 38kHz±200Hz on the counter.



SECTION 4
DIAGRAMS

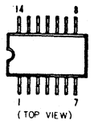
4-1. PRINTED WIRING BOARD

• Semiconductor Location

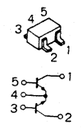
Ref. No.	Location
D301	H-11
IC301	D-17
IC302	C-21
IC303	D-23
Q301	C-23
Q302	E-2
Q303	D-5
Q304	E-3

• Semiconductor Lead Layouts

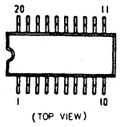
CXA1249M



XN1215

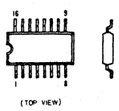


LA4580M

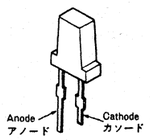


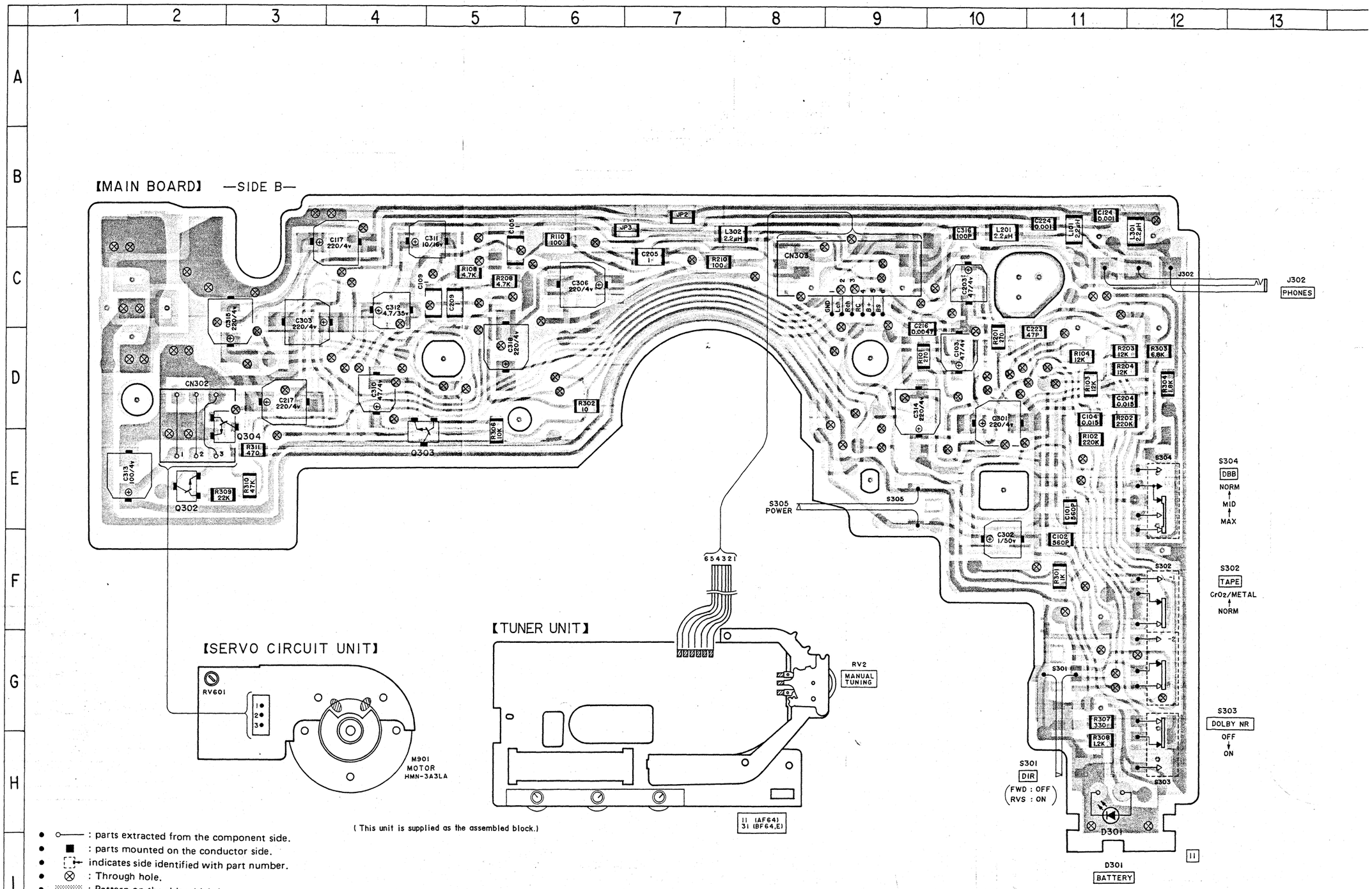
2SC1623

NJM2063AM



SLB24VR



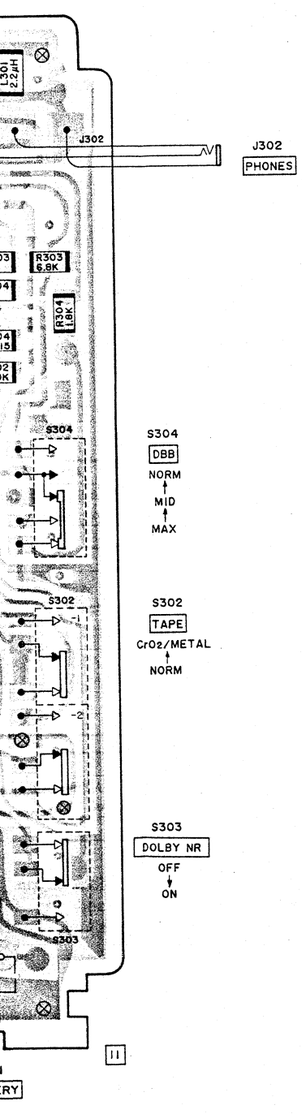


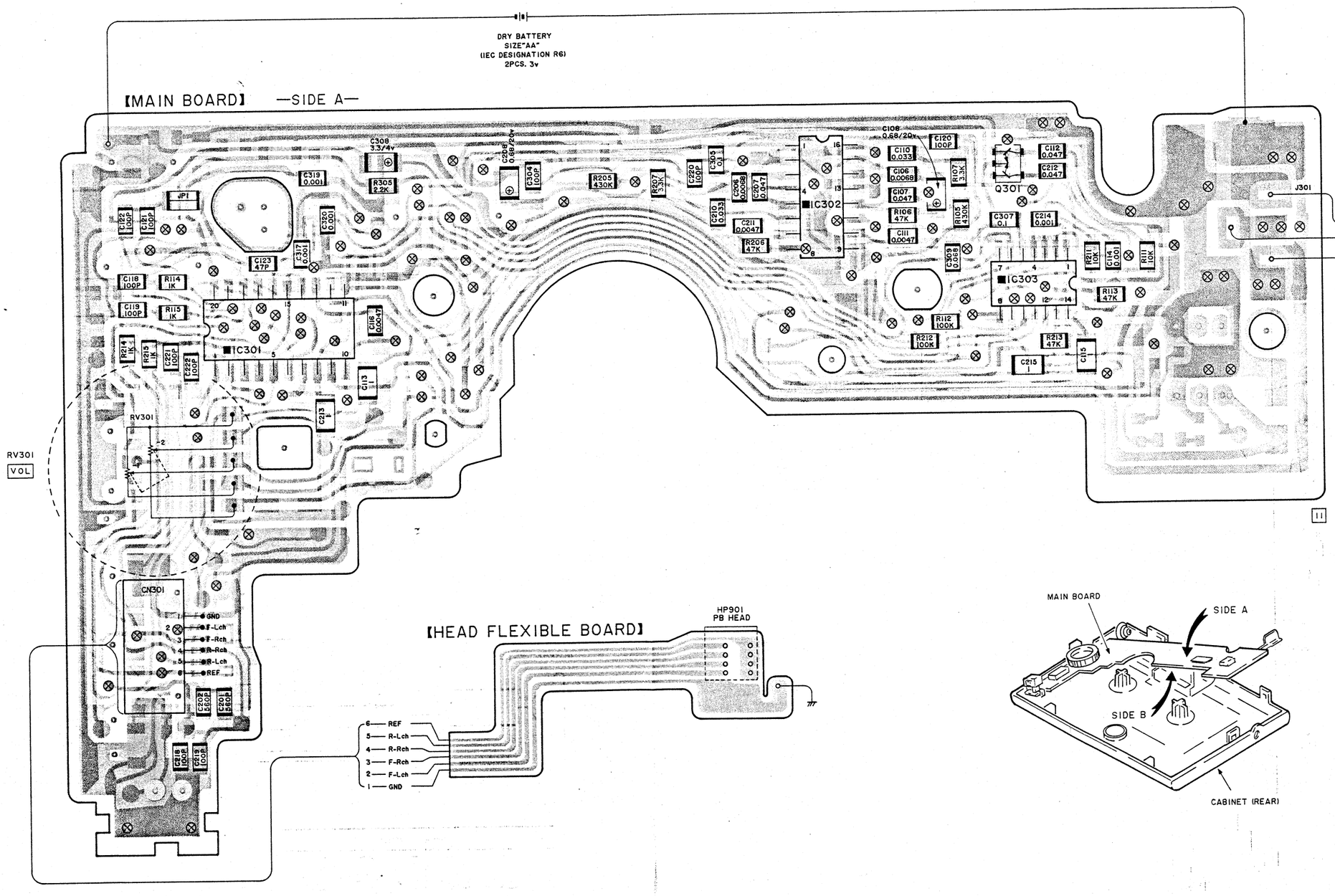
- ○—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ⊣ indicates side identified with part number.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ▨ : Pattern of the rear side.

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

DRY BATTERY
SIZE"AA"
(IEC DESIGNATION R6)
2PCS. 3v

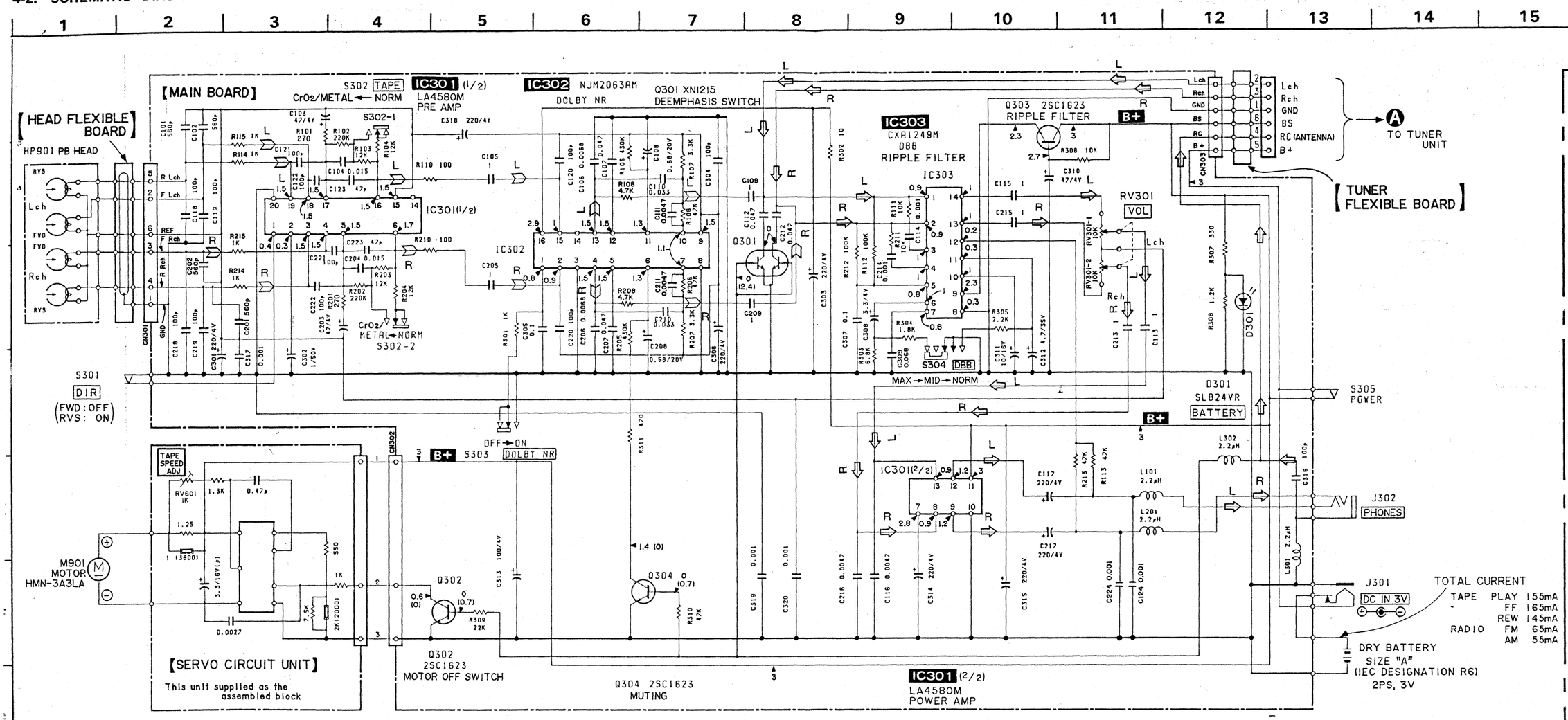
【MAIN BOARD】 —SIDE A—





【HEAD FLEXIBLE BOARD】

4-2. SCHEMATIC DIAGRAMS —TAPE RECORDER SECTION—



Note:

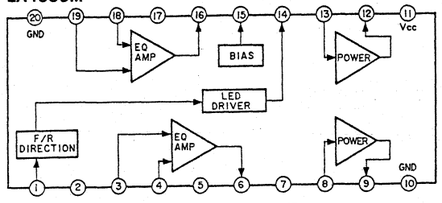
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- Switch

Ref. No.	Switch	Position
S301	DIR	OFF
S302	TAPE	NORM
S303	DOLBY NR	OFF
S304	DBB	MAX
S305	POWER	OFF

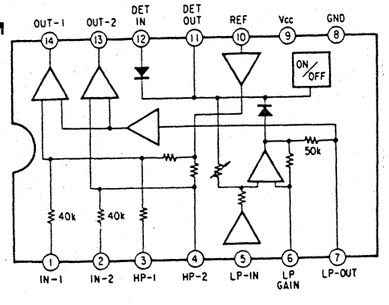
- ▬▬ : B+ Line
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3V and fed with requrated dc power.ar supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark: PLAY
  ( ): RADIO
- Voltages are taken with a VOM (50 kΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM ⇦ : PB

• IC BLOCK DIAGRAMS

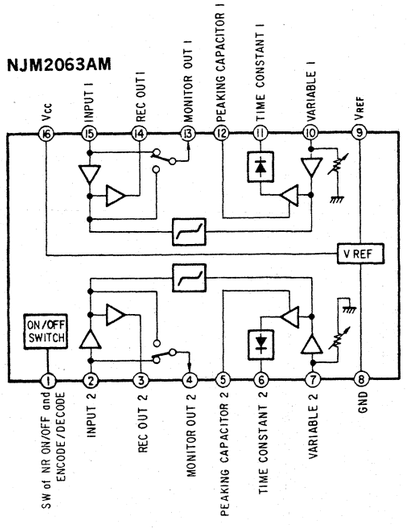
LA4580M



CXA-1249M



NJM2063AM



4-3. SCHEMATIC DIAGRAM —TUNER UNIT—

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

A B C D E F G H I J

【TUNER UNIT】 (THIS UNIT IS SUPPLIED AS THE ASSEMBLED BLOCK)

C1 100P
D1 1SS226
BPF
C35 0.0022
R8 270
Q1 2SC2714 FM RF
R3 150
L3
C3 0.0022
C43 0.001
R1 5.6K
R2 33K
C2 0.002
D2 SVC212
R4 470K
C5 4P
C4 10P
R5 470K
Q2 2SC2714 FM MIX
R6 150K
R7 330
Q2
C7 0.047
C48 0.001
R9 100K
Q3 2SC2712 FM IF AMP
R10 330
C8 0.047
L2 27μH
CF1
C39 0.047
C40 0.047
T4 AM IFT
CF2
R18 8.2K
C15 33P
T5
C16 0.047
Q9, Q10 2SA1162 SWITCH
Q9
D7 MA704
Q10
WM-AF64
R21 2.2K
R20 2.2K
WM-BF64
S2 BAND
WM-AF64 AM → LOCAL → FM DX
WM-BF64 AM → FM MONO → FM ST
S2
WM-AF64
C17 0.001
R24 470K
IC1 TA7787F FM IF/DET AM OSC,IF/DET
IC1
R12 330
R13 120K
R14 470K
C11 1P
Q4 2SC2714 FM OSC
R11 100K
C10 6P
D3 SVC212
D4 SV341
C23 0.047
T6
T3 AM OSC
R22 10K
C51 10 4V
C19 0.047
C18 0.047
C38 0.047
C20 430P
AM FERRITE-ROD ANTENNA
C21 22P
CT2
CT3
R25 470K
C24 4P
C22 0.047
R23 470K
R15 33
T2 FM OSC
CT1
C12 8P
C13 0.22
R16 39K
R17 470K
C36 0.1
C41 100P
C9 0.002
Q8
Q7 XN1501 Q8 2SA1162 POWER SWITCH
C52 10 4V
R28 56K
R27 330
Q7
R26 2.2K
R29 22K
C37 0.1
C44 0.047
L1 27μH
Q102 XN1501 SWITCH
Q103 XN1401 SWITCH
Q101 2SC2712 SWITCH
R108 22K
R104 470K
R105 1M
f MAX
RV1 22K
R106 1M
Q103
Q101
R103 470
Q102
R101 2.2K
R102 2.2K
S3 FM PRESET TUNING
-PRESET-
MANUAL→1→2→3
S3
RV102 100K
-1
-2
-3
WM-AF64
RV101 PRESET f ADJ
WM-BF64
f MIN
RV3 22K
C45 0.1
R107 470K
D102
WM-AF64
WM-BF64
D101
RV2 100K
RV2 MANUAL TUNING
D101,102 1SS184
D5 1SS184
T7
R33 6.8K
C31 0.0027
R36 10
C56 4.7 10V
C34 0.047
D6
C33 0.22
R34 3.3K
C32 47P
Q6
Q5
Q5 2SC2712
Q6 2SC3265
DC-DC CONVERTER
R31 12K
C26 0.1
C25 0.047
VCO RV4 10K
R32 22K
C27 470P
IC2 TA7370F FM MPX AM AMP
IC2
R30 39
C28 0.047
C54 3.3 4V
C29 0.001
C30 0.001
D8 1SS226
C55 10 4V
R19 47
S1 FUNCTION TAPE/RADIO OFF → RADIO
S1
L
R
L-CH
R-CH
GND
B S
R C (ANTENNA)
B+
A TO MAIN BOARD

• Switch

Ref. No.	Switch	Position
S1	FUNCTION	TAPE
S2	BAND	AM
S3	FM PRESET TUNING	MANUAL

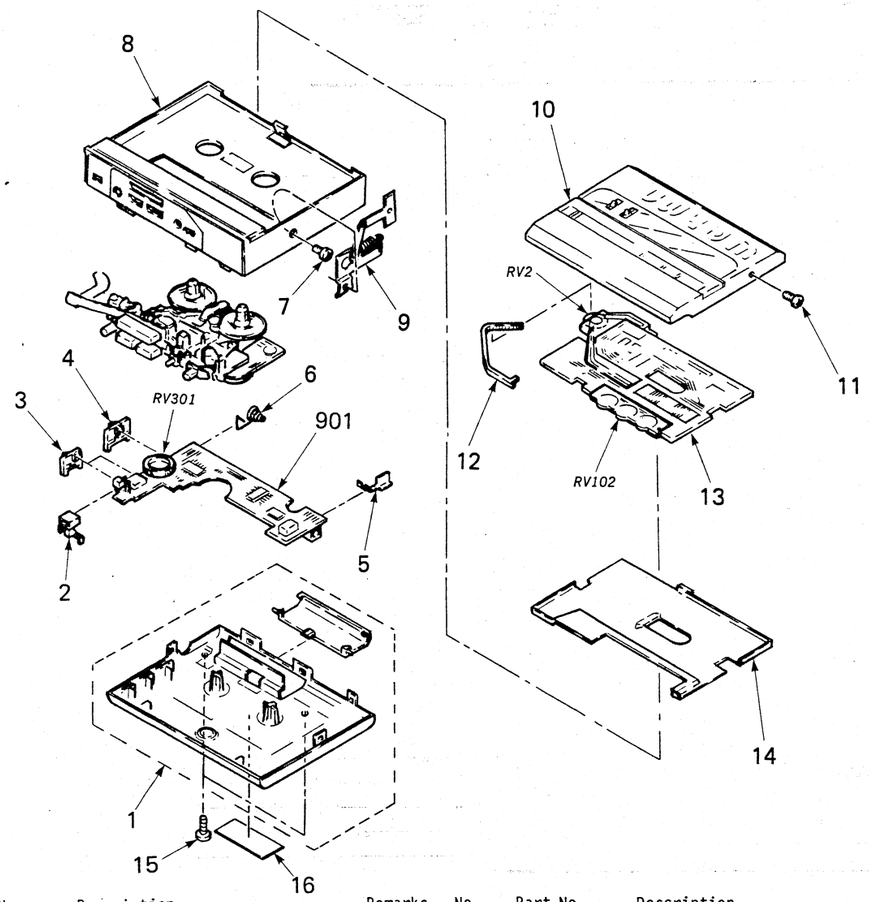
WM-AF64/BF64

SECTION 5
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) ... KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts' Color
- WG: West Germany model

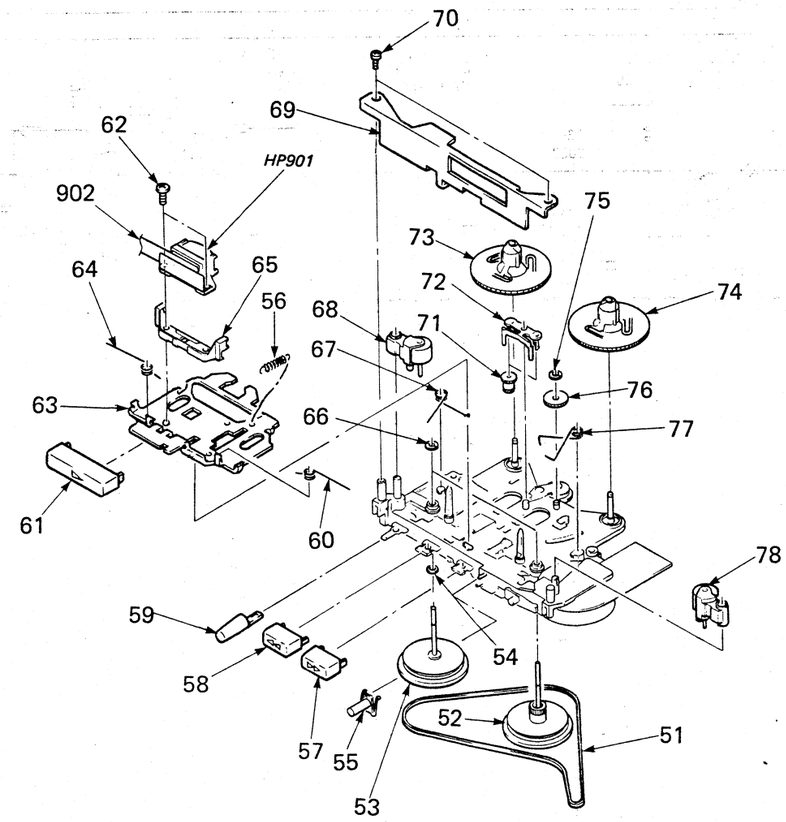
5-1. CABINET, CASSETTE HOLDER SECTION



No.	Part No.	Description	Remarks
1	X-3346-590-1	(WG)...CABINET (REAR) ASSY	
1	X-3346-548-1	(EXCEPT FOR WG)...CABINET (REAR) ASSY	
2	*3-346-727-01	HOLDER, LED	
3	3-346-725-01	KNOB (TAPE)	
4	3-346-726-01	KNOB (DBB)	
5	3-341-954-01	TERMINAL BOARD, BATTERY (+)	
6	3-341-953-01	SPRING (-)	
7	3-704-197-31	SCREW (M1.4X3.0), NYLON	
8	X-3346-547-1	(WM-AF64)...CABINET (FRONT) ASSY	
	X-3346-553-1	(WM-BF64)...CABINET (FRONT) ASSY	
9	X-3346-546-1	BRACKET ASSY	
10	X-3346-544-1	(AEP,UK,E)...HOLDER ASSY, CASSETTE	
	X-3346-545-1	(WM-AF64)...HOLDER ASSY, CASSETTE	
	X-3346-591-1	(WG)...HOLDER ASSY, CASSETTE	
11	3-704-197-21	SCREW (M1.4X2.5), NYLON	
12	3-336-708-01	RACK, POINTER	
13	1-465-012-11	(WM-AF64)...TUNER UNIT (WITH PRESET)	
	1-465-012-31	(AEP,E)...TUNER UNIT (WITH PRESET)	
	1-465-012-21	(WG)...TUNER UNIT (WITH PRESET)	
	1-465-012-41	(UK)...TUNER UNIT (WITH PRESET)	
14	*3-346-737-01	COVER	
15	3-318-203-81	SCREW (B1.7X7), TAPPING	
16	*3-347-182-01	LABEL, MODEL NUMBER	
901	A-3213-774-A	MOUNTED PCB, MAIN	
RV2	1-230-979-11	RES, VAR, CARBON (TUNING) 100K	
RV102	1-238-147-11	RES, VAR (PRESET)	
RV301	1-238-172-11	RES, VAR 10K/10K (VOL)	

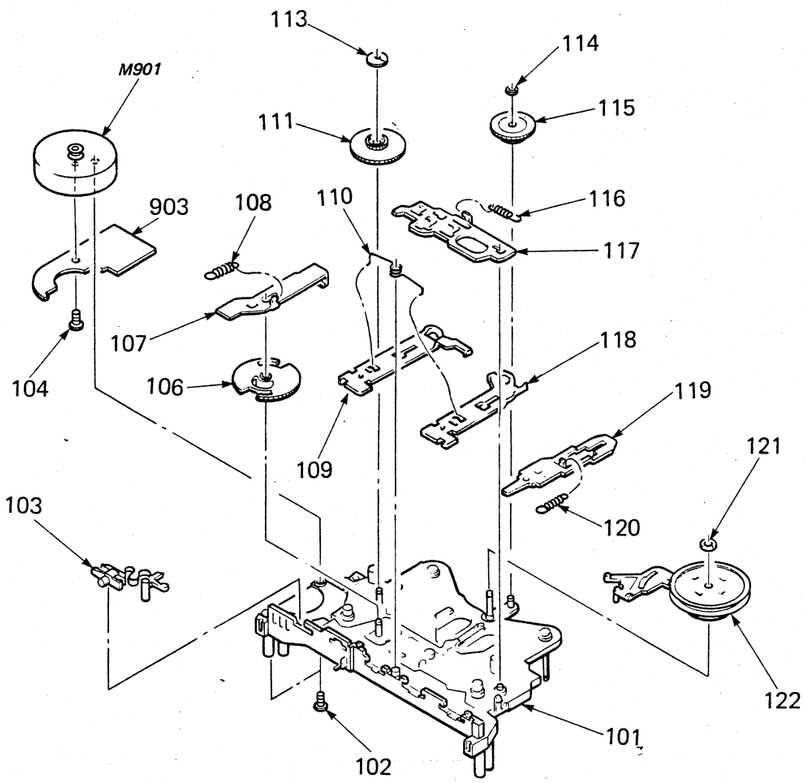
5-2.MECHANISM (1)

5-3.MECHANISM (2)



No.	Part No.	Description	Remarks
51	3-341-267-01	BELT, CAPSTAN	
52	X-3335-635-1	FLYWHEEL (T) ASSY	
53	X-3335-636-1	FLYWHEEL ASSY	
54	3-701-437-11	WASHER (242T),TEFLON	
55	3-341-294-01	BUTTON (DIR)	
56	3-341-271-01	SPRING, TENSION	
57	3-341-962-01	BUTTON (FF)	
58	3-341-963-01	BUTTON (REW)	
59	3-341-961-01	BUTTON (STOP)	
60	3-341-276-11	SPRING (N)	
61	3-341-960-01	BUTTON (PLAY)	
62	3-704-252-21	SCREW (M1.4X3.8)	
63	3-341-711-01	LEVER, PLAY	
64	3-341-277-11	SPRING (R)	
65	3-341-702-01	GUIDE, TAPE	
66	3-321-483-11	RING, RETAINING	
67	3-341-270-01	SPRING (R)	
68	X-3335-624-1	PINCH LEVER (R) ASSY	
69	3-341-762-01	HOLDER, S	
70	3-893-942-21	SCREW (1.7X5), TAPPING (B)	
71	3-341-275-01	GEAR, FR	
72	3-341-701-01	LEVER, FR	
73	3-341-291-01	GEAR, S REEL	
74	3-341-290-01	GEAR, T REEL	
75	3-341-752-01	WASHER, POLYETHYLENE (t=0.13)	
	3-341-752-11	WASHER, POLYETHYLENE (t=0.25)	
76	3-341-265-01	GEAR, R	
77	3-341-763-01	SPRING	
78	X-3335-623-1	PINCH LEVER (N) ASSY	
HP901	1-543-439-11	HEAD, MAGNETIC (PLAY BACK)	
902	1-623-643-11	PC BOARD, HEAD FLEXIBLE	
101	A-3163-146-A		
102	3-335-797-31		
103	3-341-293-01		
104	3-338-625-11		
106	3-341-292-01		
107	3-341-299-01		
108	3-341-274-01		
109	3-341-295-01		
110	3-341-268-01		
111	3-341-289-01		

5-3.MECHANISM (2)



Remarks	No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
	101	A-3163-146-A	CHASSIS ASSY		113	3-311-815-11	WASHER, POLYETHYLENE (t=0.25)	
	102	3-335-797-31	SCREW (M1.4X3), TOOTHED LOCK		114	3-570-615-01	WASHER, POLYETHYLENE (t=0.25)	
	103	3-341-293-01	LEVER, MODE		115	3-341-266-01	GEAR, T	
	104	3-338-625-11	SCREW (M1.4X1.6), WASHER HEAD		116	3-341-272-01	SPRING, TENSION	
	106	3-341-292-01	GEAR, CAM		117	3-341-298-01	PLATE, LOCK	
	107	3-341-299-01	LEVER, DIR		118	3-341-296-01	LEVER, REW	
	108	3-341-274-01	SPRING (POWER TENSION), TENSION		119	3-341-297-01	LEVER, STOP	
	109	3-341-295-01	LEVER, FF		120	3-341-273-01	SPRING, TENSION	
	110	3-341-268-01	SPRING		121	3-570-615-01	WASHER, POLYETHYLENE (t=0.25)	
	111	3-341-289-01	GEAR, DECELERATION		122	A-3239-894-A	WHEEL ASSY, MIDWAY	
					903	1-236-042-21	CIRCUIT UNIT, SERVO	
					M901	A-3133-336-A	MOTOR BLOCK ASSY	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

- WG: West Germany model

Ref.No.	Part No.	Dscription		
901	A-3213-774-A	MOUNTED PCB, MAIN		
C101	1-163-135-00	CERAMIC CHIP 560PF	10%	50V
C102	1-163-135-00	CERAMIC CHIP 560PF	10%	50V
C103	1-126-208-11	CAP,ELECT 47MF	20%	4V
C104	1-163-023-00	CERAMIC CHIP 0.015MF	10%	50V
C105	1-162-638-11	CERAMIC CHIP 1MF		16V
C106	1-163-019-00	CERAMIC CHIP 0.0068MF		50V
C107	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C108	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C109	1-162-638-11	CERAMIC CHIP 1MF		16V
C110	1-163-034-00	CERAMIC CHIP 0.033MF	10%	25V
C111	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C112	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C113	1-162-638-11	CERAMIC CHIP 1MF		16V
C114	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C115	1-162-638-11	CERAMIC CHIP 1MF		16V
C116	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C117	1-126-210-11	CAP,ELECT 220MF	20%	4V
C118	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C119	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C120	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C121	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C122	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C123	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C124	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C201	1-163-135-00	CERAMIC CHIP 560PF	10%	50V
C202	1-163-135-00	CERAMIC CHIP 560PF	10%	50V
C203	1-126-208-11	CAP,ELECT 47MF	20%	4V
C204	1-163-023-00	CERAMIC CHIP 0.015MF	10%	50V
C205	1-162-638-11	CERAMIC CHIP 1MF		16V
C206	1-163-019-00	CERAMIC CHIP 0.0068MF		50V
C207	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C208	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V
C209	1-162-638-11	CERAMIC CHIP 1MF		16V
C210	1-163-034-00	CERAMIC CHIP 0.033MF	10%	25V
C211	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C212	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C213	1-162-638-11	CERAMIC CHIP 1MF		16V
C214	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C215	1-162-638-11	CERAMIC CHIP 1MF		16V
C216	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C217	1-126-210-11	CAP,ELECT 220MF	20%	4V
C218	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C219	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C220	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C221	1-163-117-00	CERAMIC CHIP 100PF	5%	50V

Ref.No.	Part No.	Dscription		
C222	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C223	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C224	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C301	1-126-210-11	CAP,ELECT 220MF	20%	4V
C302	1-126-193-11	CAP,ELECT 1MF	20%	50V
C303	1-126-210-11	CAP,ELECT 220MF	20%	4V
C304	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C305	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C306	1-126-210-11	CAP,ELECT 220MF	20%	4V
C307	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C308	1-135-103-00	TANTAL. CHIP 3.3MF	10%	4V
C309	1-163-833-00	CERAMIC CHIP 0.068MF		25V
C310	1-126-208-11	CAP,ELECT 47MF	20%	4V
C311	1-124-779-00	CAP,ELECT 10MF	20%	16V
C312	1-126-198-11	CAP,ELECT 4.7MF	20%	35V
C313	1-126-209-11	CAP,ELECT 100MF	20%	4V
C314	1-126-210-11	CAP,ELECT 220MF	20%	4V
C315	1-126-210-11	CAP,ELECT 220MF	20%	4V
C316	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C317	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C318	1-126-210-11	CAP,ELECT 220MF	20%	4V
C319	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C320	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
CN301	*1-566-682-11	HOUSING, CONNECTOR 6P		
CN302	1-566-692-11	SOCKET, CONNECTOR 3P		
CN303	*1-566-682-11	HOUSING, CONNECTOR 6P		
D301	9-988-942-01	DIODE SLB-24VR		
IC301	8-759-820-66	IC LA4580M		
IC302	8-759-701-07	IC NJM2063AM		
IC303	8-759-805-09	IC CXA1249M		
J302	1-562-974-11	JACK (PHONES)		
JP1	1-216-296-00	METAL GLAZE 0	5%	1/8W
JP2	1-216-295-00	METAL GLAZE 0	5%	1/10W
JP3	1-216-295-00	METAL GLAZE 0	5%	1/10W
L101	1-410-196-11	INDUCTOR CHIP 2.2UH		
L201	1-410-196-11	INDUCTOR CHIP 2.2UH		
L301	1-410-196-11	INDUCTOR CHIP 2.2UH		
L302	1-410-196-11	INDUCTOR CHIP 2.2UH		
Q301	8-729-403-17	TRANSISTOR XN1215		
Q302	8-729-102-62	TRANSISTOR 2SC1623		
Q303	8-729-102-62	TRANSISTOR 2SC1623		
Q304	8-729-102-62	TRANSISTOR 2SC1623		

Ref.No.	Part No.	Dscription			
R101	1-216-035-00	METAL GLAZE	270	5%	1/10W
R102	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R103	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R104	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R105	1-216-112-00	METAL GLAZE	430K	5%	1/10W
R106	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R107	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R108	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R110	1-216-025-00	METAL GLAZE	100	5%	1/10W
R111	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R112	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R113	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R114	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R115	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R201	1-216-035-00	METAL GLAZE	270	5%	1/10W
R202	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R203	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R204	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R205	1-216-112-00	METAL GLAZE	430K	5%	1/10W
R206	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R207	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R208	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R210	1-216-025-00	METAL GLAZE	100	5%	1/10W
R211	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R212	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R213	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R214	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R215	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R301	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R302	1-216-001-00	METAL GLAZE	10	5%	1/10W
R303	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R304	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R305	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R306	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R307	1-216-037-00	METAL GLAZE	330	5%	1/10W
R308	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R309	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R310	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R311	1-216-041-00	METAL GLAZE	470	5%	1/10W
RV2	1-230-979-11	RES, VAR, CARBON (TUNING) 100K			
RV102	1-238-147-11	RES, VAR (PRESET)			
RV301	1-238-172-11	RES, VAR 10K/10K (VOL)			

Ref.No.	Part No.	Dscription
S301	1-571-149-11	SWITCH, LEAF (DIR)
S302	1-571-277-22	SWITCH, SLIDE (TAPE)
S303	1-571-275-21	SWITCH, SLIDE (DOLBY NR)
S304	1-571-506-21	SWITCH, SLIDE (DBB)
S305	1-571-149-11	SWITCH, LEAF (POWER)

ACCESSORY & PACKING MATERIAL

*3-346-756-01	CUSHION (UPPER)
*3-346-757-01	CUSHION (LOWER)
*3-346-760-01	(CANADIAN)...INDIVIDUAL CARTON
*3-346-758-01	(USA)...INDIVIDUAL CARTON
*3-346-762-01	(E)...INDIVIDUAL CARTON
*3-348-409-01	(AEP,WG,UK)...INDIVIDUAL CARTON
3-786-018-21	(WM-AF64)...MANUAL INSTRUCTION
3-786-018-11	(WM-BF64)...MANUAL INSTRUCTION
3-786-018-41	(WG,AEP)...MANUAL INSTRUCTION
8-952-260-91	(US,CANADIAN,AEP,WG,UK)...HEADPHONE MDR-W10L/B SET
8-952-350-90	(E)...EARPHONE MDR-E454 SET
X-3346-549-1	CASE ASSY, CARRYING